CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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SECURITY INFORMATION

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THE SOURCE EVALUATIONS IN THIS REPORT ARE DEFINITIVE.
THE APPRAISAL OF CONTENT IS TENTATIVE.
(FOR KEY SEE REVERSE)

1. As requested by the Soviet-sponsored Ministry of Interior, the large Jasmunder Bodden is to be made available to shipping as an anchorage by the summer of 1954. This may be accomplished by making an excavation east of Glowe. At the same time a waterway must be made which is to lead to the extensive harbor and shipyard installations which are also to be constructed. In later years, these installations will be grouped all around the Bodden.

NAVY Review Completed

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25 YEAR RE-REVIEW

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2. The most important prerequisite for the complete use of the Jasmunder Bodden is a completed channel, dredged to its full 12 m. However, for protection, it would be necessary to complete the outer harbor mole installation. Since this is not possible, the following compromise was accepted. By the summer of 1954, at least 300 running meters of quayage in the so-called fishing harbor must be completed. In order to allow smaller units (requiring six meters of water) to use the harbor by that date, the natural cofferdam which will remain as a canal boundary on the northside will have to be broken through to a width of 60 m. and a depth of six meters below mean water level. In order to give this entrance the necessary protection against running seas, the mole installations (east and west moles) should be finished to the six-meter water line by the end of 1954.

3. Final complete dredging of the above-mentioned cofferdam will hardly be necessary or possible before 1956 or 1957. By then the large shipyard construction (dry and building docks) on the eastside of the Bodden in the latitude of Martins Port, will be completed; furthermore, the mole installations can be completely finished by then.

4. Since the moles will not be completed until 1956, the entrance to the canal will be inadequately protected at the time the canal is open to traffic (end of 1954). However, this is not considered serious, since the entrance will be dredged only to six meters and since the waves caused by storms from the northwest to a northeast direction will break up on the rising beach. Only seldom would one have to count on the waves coming into the canal, and then the back water would slow down the water disturbance very quickly.

5. However, one will have to reckon with a large amount of erosion directly on either side of the entrance. Large reserves of stone shoring (stone facing) and wattlework would have to be installed for such an event in the immediate vicinity. Furthermore, smaller units would have difficulty in entering and leaving during wind velocities of Beaufort scale four or more, and during upland winds (east over south to northwest).

6. In order to meet the above emergencies as quickly as possible, the order was given to hasten the completion of the outer harbor in a building program through 1956. The east mole was favored and is to be completed ahead of the west mole. Reasons for this are as follows:

   a. The oil depots are to be located on the east side of the outer harbor and, together with the nearby underground storage depots, were given a very high priority.

   b. Since the east mole is considerably shorter than the west mole, one could construct berths for a depth of 12 m. much quicker. By the end of 1955 the mole is to be completed as far as the molehead. Of special importance is the fact that the railroad tracks planned on the east mole can be connected directly to the network of tracks on the island and therefore, no ferry will be needed.

[redacted] 25X1

c. Navigational considerations are part of the deciding factors. Sixty per cent of all winds come from a southwest to northwest direction. During the winter about 20% of the winds come from an eastern to a northeastern direction. The Arkona peninsula can act as a natural wind protection for the entrance from almost all winds except those from the north. The west mole, which runs about 450 m. long in a west-east direction, would have to protect the entrance from the north. But this construction will not be complete until 1956.

7. On the other hand, the conditions on the east side are considerably different. As has been proved in the large model in Potsdam, southeast to northeast winds cause a strong east-west current along the coast at Glowe. In cold weather these winds would also bring floating ice to the canal entrance creating a danger of shifting ice. These east cross winds would influence navigation in the canal entrance very much. In case of drift ice together with shifting ice, it is to be expected that shipping would be halted.

8. During 1938-40, [redacted] sufficient opportunity to study the boring results and determine the ground conditions. 25X1
Therefore [redacted] able to carry forward the plans of the mole 25X1
construction in so short a time that the building of the west foundation was started 1 December 1952. It must be added, however, that the construction methods now being carried out would not have been employed by the Germany Navy. The impossibility of procuring sheet-piling, wide-flanged steel I-beams, and steel ramming piles in the Soviet Zone of Germany forced [redacted] a completely different structural shape than 25X1
planned in 1938-40.

9. In order to better present the development, the type of construction planned in the years 1938-40 will be described first. It must be pointed out that at that time the moles were to function only as breakwaters, jetties and, in some instances, also as berths. The planning of the German Navy was based on the fact that berths for large ships were available in the neighboring harbors of Stettin, Luebeck, and Kiel. In todays' plan the moles are being developed as efficient loading piers.

10. In 1938-40, examination of the ground gave a favorable picture for the base of the moles. There was chalk over which marl was found descending at a sharp angle to the sea. This type of ground can be loaded to a weight of 8 kgm/cm^2 (17.6 lbs. per centimeter squared) and furthermore, it has other good qualities such as the coefficient of friction, sliding resistance, and permeability.

11. Doubtlessly sheet-pilings would have served as the main part of the construction. But in the more shallow water near the coast, an extraordinary number of stones was found which were deposited there during the Ice Age and then in time exposed by the sea.

12. The construction shown in the first sketch /Enclosure (A)7 was therefore planned. Wide-flanged steel I-beams in various

 [redacted] 25X1

statically determinate sections were to be framed by an auxiliary structure at intervals of about three meters. The wide-flanged steel I-beams give way or turn to a limited extent, as soon as they hit against a stone and would cause a sheet-piling to spring out of its lock, thus damaging the bulkhead. Therefore, it was planned to place reinforced concrete girders horizontally on top of each other between the supporting beams. These girders were to be prepared in various dimensions on land and put in storage, ready for use. The inserted girders would have to be stronger toward the bottom of the sea than at the water line. These girders were to interlock similarly as with reinforced concrete sheet-pilings. With the help of prepared casing piles, the beams were to be embedded in concrete by means of underwater concreting and a ramming scaffold. Thickness from the outer edge of the beam to the inner edge of the concrete wall, about one meter. On this concrete wall, a continuous reinforced concrete girder would have been placed to enclose the wide-flanged steel I-beam heads and at the same time serve as a foundation for the construction of the mole. In deeper water, stays would have had to be used in order to reduce the cost and to preserve the free length of the supports.

13. Filling in the area behind the construction would have created the necessary harbor site. Sandy types of terrain are found in the Tromper Wiek which could have been obtained by floating dredges for this purpose.

14. As has already been explained, comparatively few stones are found in the deeper water so that in depths of six - eight meters under mean water level, a tightly closed steel sheet-piling could have been provided instead of the wide-flanged steel I-beams. The concrete apron could have then been omitted. The continuation piece with parapet would have had to be constructed as already described.

15. Another sketch [Enclosure (B)], shows the actual mole construction as it was planned for Ruegen. Ramming of the outer row of sheet-piling separately from the inner row could have been accomplished by using two heavy floating rams. Use of a temporary ramming scaffold is impossible in depths of about five - six meters. Divers would have had to explore for erratic blocks and other hindrances and remove them so that the ramming work could have been accomplished without undue delay. After the mainstay with the parallel running stays had been installed, the filling in with stones or sand would have been accomplished. As soon as the entire mole had stood for a sufficient period of time, so that a settling of any importance could have been no longer expected, the concreting of the covering plate with the parapet and auxiliary stays could have been accomplished from the landside without interruption.

16. Present construction methods [redacted] developed for the shoring and sides of the outer harbor were as follows: 25X1

a. The monolithic land section (root) [See Enclosure (C)].

As was mentioned above, sheet-piling sections, wide-flanged steel I-beams, and steel ramming piles (special sections) cannot be procured in the Soviet Zone because their steel industry is not in a position to produce such high grade sections. Furthermore, ramming piles (diameter more than 0.25 m.) and round steel (reinforced iron) are only available in limited amounts.

The accompanying sketch /Enclosure (C)/ applies to the construction of the root of the west mole. Experience shows that the root of a mole or quay construction is the most vital part. Special technical devices against squeezing and backwashing must be provided. The connection southwest of Koenigshorn, i.e., near Glowe, will be made by a jetty. This jetty must be constructionally connected to the quay and must be built so that the approaching waves from the north or northeast dissipate their strength on the rising embankment. For this reason the quay will be wider on the eastside /as shown on Enclosure (C)/. The final form of the concrete body has not as yet been completely determined and will depend upon the hydraulic tests now being conducted by the Hydrographic Institute at Potsdam. On the landside, the construction should be connected to the high shore so that the danger of backwash may be avoided.

After the necessary ground test had been completed, the following construction method was followed:

Ramming was started using cantilever rams on the west side of the construction on 1 December 1952 and should have started on the east side on 1 February 1953. While the piles in the outer rows are spaced about two meters apart, the inner rows are to form a closed wooden sheet piling. The wooden constructions are to be connected by strut beams, clamps, etc., to form a massive framework. Toward the west side, fascine mattresses will be placed between the rows of piles and the sheet-piling. On the east side, a dike of large erratic blocks will give protection against heavy seas. This dike will also serve as support for the filling which will be available soon from the dredging of the canal. The filling available on the construction site will not be sufficient for the second phase of construction so that additional terrain will have to be acquired.

After completing this sheet-piling enclosure, the excavation will be drained by means of a pump installed on the shore. By means of a small dredger installed on an auxiliary structure, the required depth in the excavation will be attained. The foundation of the concrete enclosure should be about one meter below the natural floor level. It will be attempted to ram a concrete apron in very small sections almost to the end of the sheet-piling on the outer side. In 15 meter-long concrete sections, from the expansion joint to the next joint, the individual locks will be concreted in one operation as high as the mean water level. Cogging and iron connections are provided so that the cementing to the upper part is assured.

After the lower part of the construction is concreted and sufficiently set, the removal of the ramming framework can be accomplished. The outer rows of piles should be accomplished. The outer rows of piles should be pulled and the sheet piling be cut under water above the ground. On

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the water side, divers will then supplement the fascine mattresses with additional fascines-additional bottom support.

Concreting of the upper portion can only be accomplished when the entire west mole is completed, so that the entire construction can settle sufficiently first and cracks caused by the settling may be avoided. Concreting can then be done from both ends simultaneously, while main cable duct is left hollow and later equipped.

b. The block construction method from the monolithic part of the mole proper /see Enclosures (D) and (E)/

As described above, the monolithic part ends at about the two meter water line. A solution was found which follows the so-called block construction method and which will enable the construction to be carried farther out to sea.

The hydrographic service of the Seepolizei determined the height of the waves to be two meters above the mean water level. An addition for spray water was made bringing the height of the top edge of the mole to + 2.22 meters above low tide. The top edge of the parapet was fixed at three meters above low tide.

The static pre-examination disclosed that a concrete block of about 55 tons, which is subjected to the strongest attack by water, is not moved from its position. Therefore, the maximum lifting power of the various special cranes was fixed at 60 tons and special cranes (described later) were ordered. Blocks of various shapes were developed which all had the same weight despite the difference in dimensions. The dimensions for the individual blocks are as follows:

From Top to Bottom

Stone 1 - 2 m. wide, 3.50 m. deep, 3.30 m. high $= 23.1\ m^3 \times 2.4\ t/m^3 = 55.44$ T.

Stone 2 - 2 m. wide, 4 m. deep, 2.90 m. high $= 23.2\ m^3 \times 2.4\ t/m^3 = 55.68$ T.

Stone 3 - 2 m. wide, 4.50 m. deep, 2.60 m. high $= 23.4\ m^3 \times 2.4\ t/m^3 = 56.16$ T.

Stone 4 - 2 m. wide, 5 m. deep, 2.30 m. high $= 23\ m^3 \times 2.4\ t/m^3 = 55.2$ T.

Stone 5 - 2 m. wide, 5.50 m. deep, 2.10 m. high $= 23.1\ m^3 \times 2.4\ t/m^3 = 55.44$ T.

Also shown /on Enclosure (D)/, is the construction of the cogging. Each stone is constructed with two raised bilges or two oblong notches on all four longitudinal sides; thus there are no straight joints anywhere. At this point, it must be mentioned that the main pressure exerted on these blocks is not by the water, but by the pressure of the wet back filling. The tracks which lead to the west mole must be laid on this back filling, about 30 m. from the quay, since the construction cannot absorb the load of the rolling stock.

Before commencing the construction of the shore wall, a careful longitudinal section in the axis of this wall with closely spaced soundings (one meter) must be made. The results will be plotted and the plan for laying the blocks will be made accordingly. The blocks will be numbered and prepared in the factory. Since all cement blocks from type (1) through (5) have the same width of two meters and on all stones the bilges and/or notches are so arranged that, for example, stone (1) can be placed on stone (3), it will be possible to determine the best combination of the stones according to various water depths determined by the soundings. After the axis of the sea floor has been cleared by divers and all hindrances removed by blasting, if necessary, the placing of stone 1 in conjunction with the monolithic part may be started.

According to the plan /See Enclosure (E)/ the stones will be brought under the crane on a service track which is on the construction part already completed above mean water level. The stones are placed in the wagon in such a manner that the two-meter side is to the front, that is, under the trolley carriage, they must be turned 90°. The idea for developing this type of crane framework was taken from bridge construction. The crane framework runs on tracks. These tracks are placed horizontally on reinforced concrete girders. The girders are cemented to the blocks already in place and thus create a firm longitudinal binding of the top row of stones. The crane framework can be sufficiently directed on its wheel so that small curves can be negotiated. After the trolley carriage has run back to the counter-balance, the stone is hooked on and the trolley carriage brings it to the construction spot at the beginning of the quay wall. The stone is let out gradually until it can be turned under the crane framework. With the help of devices, the stone is then put in place. The process is then repeated.

This method can be used as far as the ten meter water line. Then it is almost necessary to employ the developed mole construction methods, particularly because the tracks for the west mole must be placed at the beginning of the mole in such a way that the shore wall is considerably loaded.

c. The mole construction /see Enclosures (F), (G), (H), and (I)/

The method described above /under b./ cannot be applied in the construction of the moles. Even if two of the described crane frameworks were employed (for each side of the mole), construction would progress slowly. Particularly because the range of these cranes is limited, the crane would always have to be moved forward (construction of tracks), and furthermore, this equipment cannot be used in building the partitions and other reinforced concrete connecting sections. Therefore, in 1952 a block setting crane /see Enclosure (F)/ was developed and manufactured for the west mole, which will be ready in May 1953 and one for the east mole, which will be ready in June 1953. The technical data is 60 tons lifting capacity with 18 m. working radius. The upper crane structure can be moved 360°, and at the outer end there is an additional lifting device for five

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tons. This serves to assist the divers in removing obstacles. The crane operates on its own power, diesel-electric.

The procedure of the work is similar to that described above /under b./. First, divers clear the sea floor along the construction axis. Next the floating dredges produce the necessary depth of 12 m. under mean low water. Extensive dredging is necessary for the east mole. Then the first two bottom stones are layed with the aid of divers who, while laying the bottom stones with the help of cement sacks, must watch that the stones lie horizontally. On the basis of the placement plan, the stones are layed according to numbers. The same width of all stones (two meters), the vertical arrangement, and the cogging construction, all permit the assembly of the blocks in various ways, according to the depth, for example (5) on (3), (1) on (3), etc.

As soon as the crane has placed the next six stacks of blocks on top of each other, the prepared round iron frame of the reinforced concrete partition is put in the slot left open for it. The prepared mole walls are then set up and fastened by divers to the two (2) bulkheads between the two (2) rows of stones. Now the bulkhead can be concreted by the underwater process. At the same time the longitudinal girders on the top stone are brought into place which, together with the supporting beams of the crane track and the sill, which is concreted on the partition, form the constructional framework of the mole.

After this process is well underway, the construction should progress very quickly. In the rear part of the mole which has been completed, the spaces between the bulkhead are filled with stones and sand without disturbing the advance construction. The concreting of the top part of the mole (from about 0.3 m. above low tide to 2.22 m. above low tide) is accomplished when the crane has completed its task and has been cleared from the mole. Thereby the construction has a longer time to settle.

[redacted] a sketch /Enclosure J/ which shows how the partition should fit into the two rows of stones. The spaces in the stones are arranged so that they lie over each other and fit to each other. By this method every second row of stones is fastened to the next one. Only the middle row of the three remains without this security. 25X1

17. Described below is a method of constructing the mole proper which [redacted] would be feasible and which would considerably accelerate construction. 25X1

a. Attention is called to Soviet demands that if the deadlines must be met with the method of construction described above /in 16 c./, it will be very difficult to complete the moles on time. Continuous investigations were being made to determine whether the method of construction using floating caissons could be used in addition. It is undoubtedly the most modern and fastest method of construction.

b. As soon as it is possible to work with floating caissons, construction could be carried out from the moleheads as well as from land. All considerations of this possibility were dropped because no appropriate site on Ruegen could be found where the large floating caissons could have been built (slip or dock). Construction of an appropriate installation (slip) was often considered. For such a large floating caisson there would have to be a submerging depth of at least six meters. Possibilities on land, near Stralsund, were also examined but dropped because of the distance of transportation.

c. [redacted] By about February 1954, the northern part of the canal, in a stretch of about 150 m., could be made ready by exerting every effort. The chalk and marl floor found here guarantees a dry construction pit. The floating caissons could be installed in three adjoining rows at the base of the canal at a width of 90 m. and a depth of 12 m. below low tide, like a dock. A very fast and most favorable (in cost, materials, and deadlines) construction of the moles would be possible. When the canal is flooded in the fall of 1954, the caissons would float and could be towed to the construction site. 25X1

d. In my opinion, it will be possible to meet all deadlines by using the floating caisson construction method. No difficulties will be encountered in constructing the moles as far as equipment and materials (round iron, cement, gravel, and sand) are concerned. Procurement of labor will also be accomplished promptly. The lack of first class expert engineers, however, will show itself in carrying out such a difficult construction project.

[redacted] Comments: In countries where the availability of steel poses no problem, the construction methods described in this report would perhaps appear incongruous, especially in consideration of the magnitude and relative importance of the Ruegen Harbor Project. The ingenious alternative methods of construction planned [redacted] and covered in this report, serve to emphasize again how fortunate it is that [redacted] imagination and creative ability are no longer available to East Germany and USSR./ 25X1 25X1 25X1

ENCLOSURE (A): Sheet-piling Type Construction, Part A

ENCLOSURE (B); Sheet-piling Type Construction, Part B

ENCLOSURE (C): Mole Root Construction

ENCLOSURE (D): Shape of Concrete Block

ENCLOSURE (E): Placing Blocks from Shore to Seaward

ENCLOSURE (F): Cross Section of the Mole during Construction

ENCLOSURE (G): Longitudinal Section of the Mole during Construction

ENCLOSURE (H): Top View of Mole in Various Stages of Construction

ENCLOSURE (I): Cross Section of Completed Mole Showing Transport Capabilities

ENCLOSURE (J): Top View Showing Placement of Reinforced Concrete Partition.

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Enclosure (A)

SHEET-PILING TYPE CONSTRUCTION - PART A

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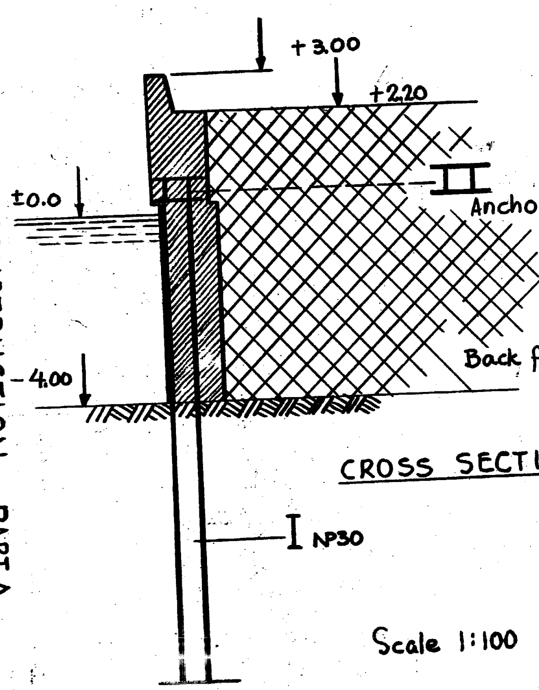

CROSS SECTION

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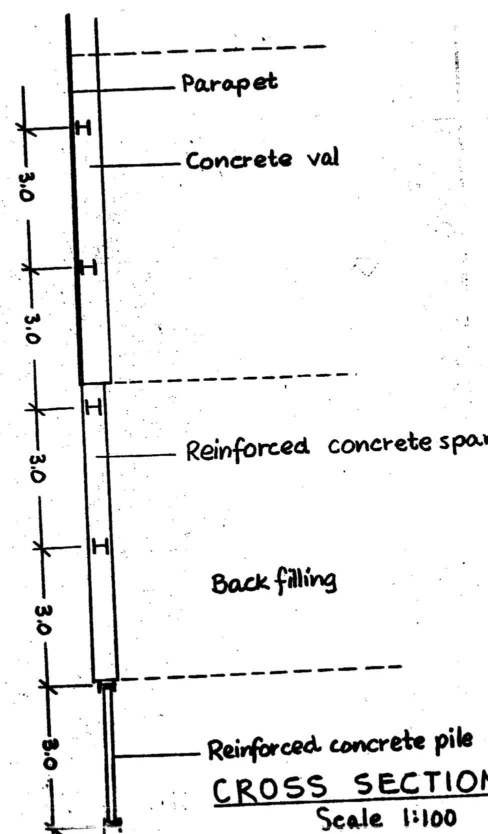

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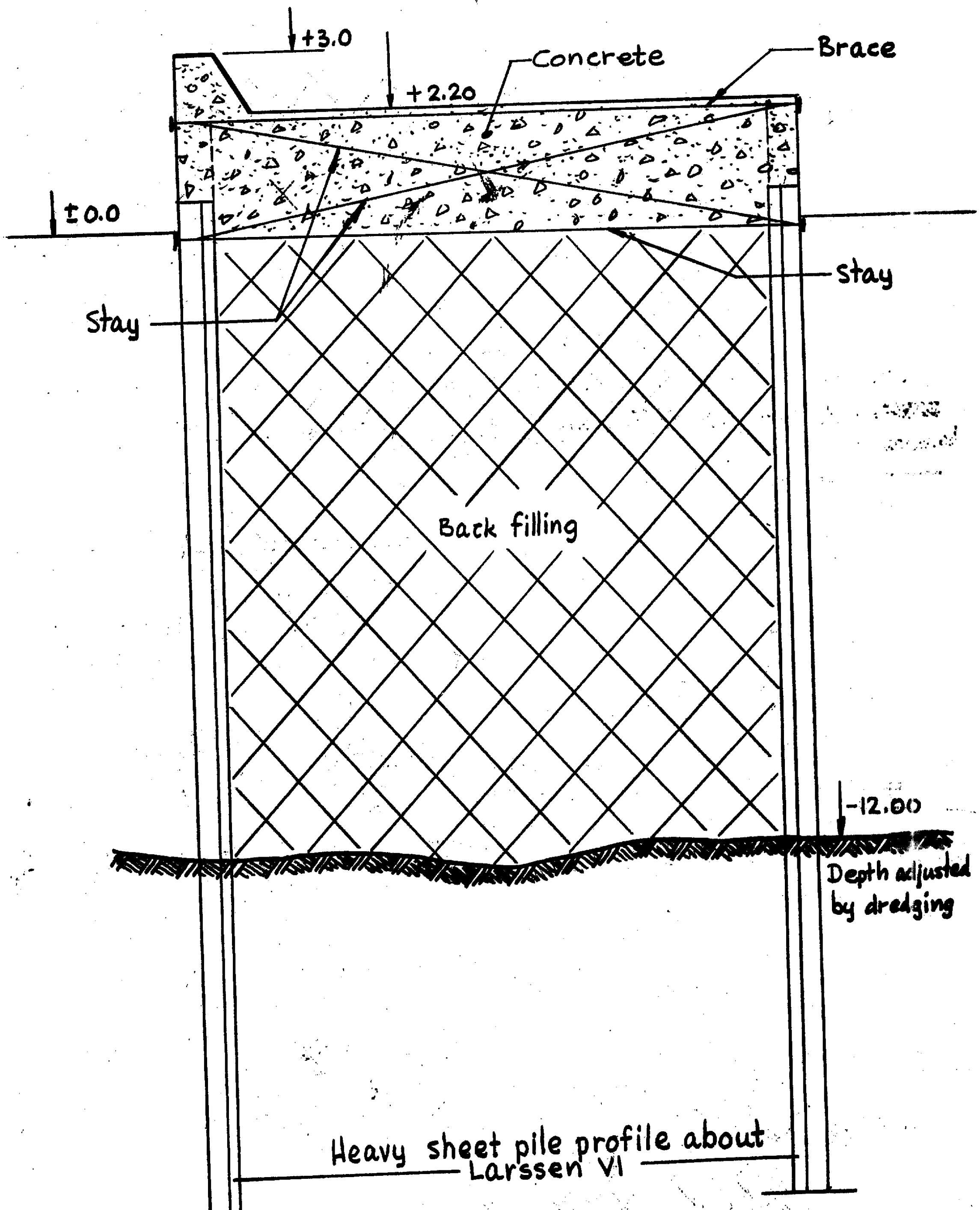

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SHEET-PILING TYPE CONSTRUCTION – PART B

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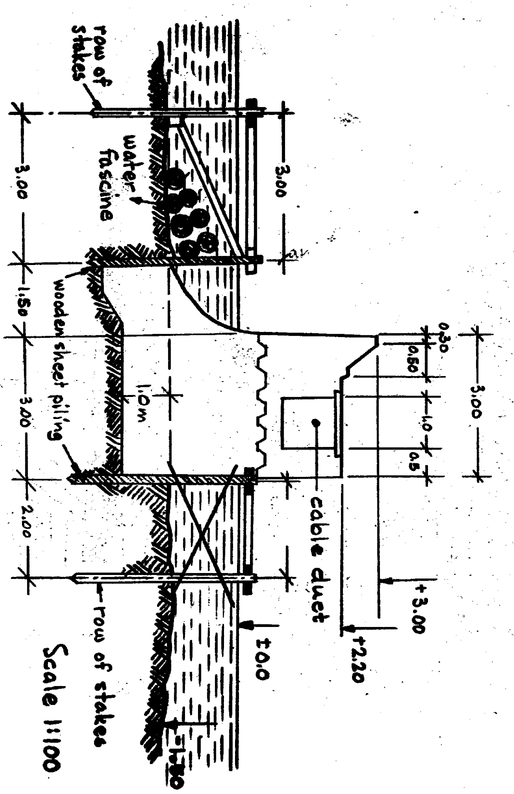
Enclosure (B)

Enclosure (C)

MOLE ROOT CONSTRUCTION



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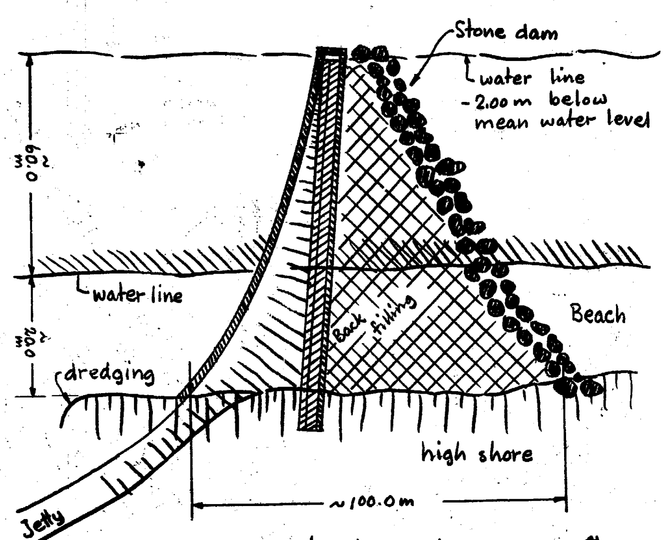

Location Sketch - scale 1:12,500

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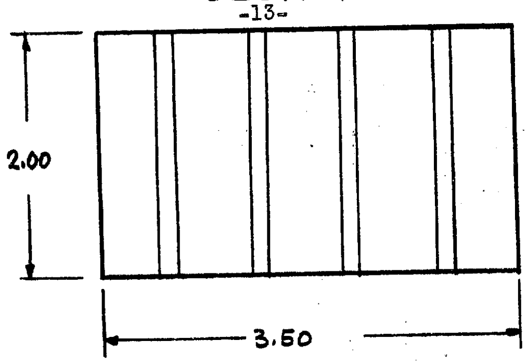
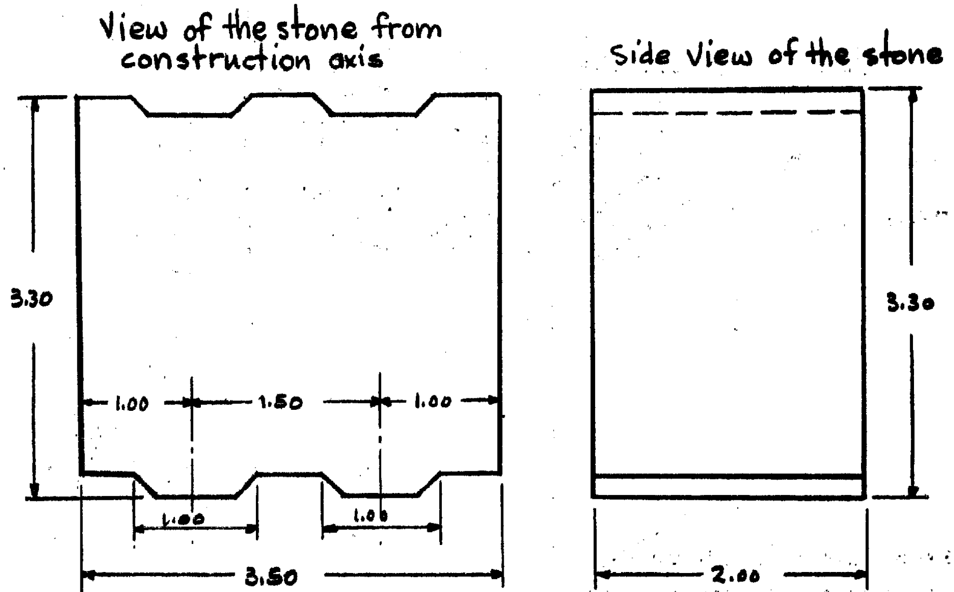
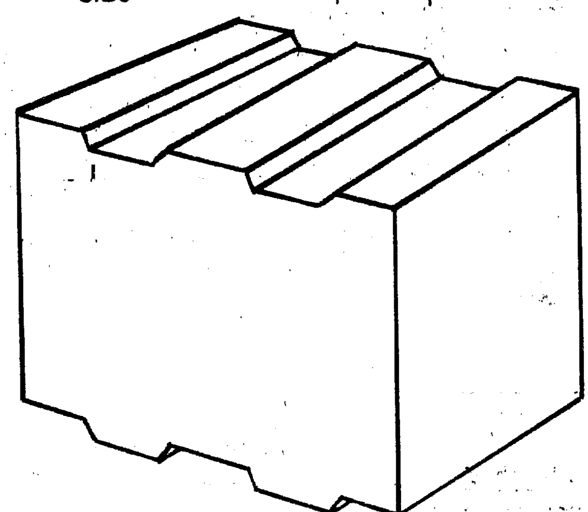


Top View





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SHAPE of CONCRETE BLOCK

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Enclosure (E)

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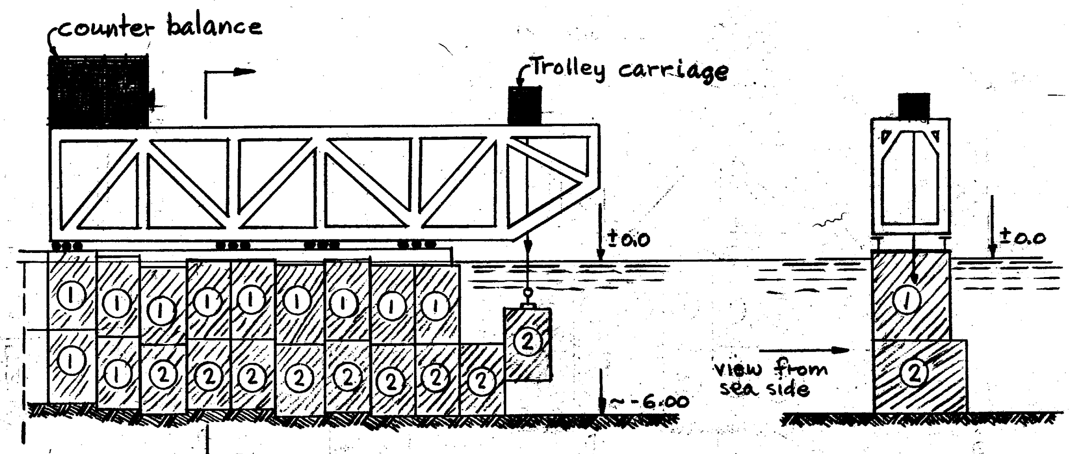
PLACING BLOCKS from SHORE to SEAWARD



View of the shore wall with crane

Cross Section

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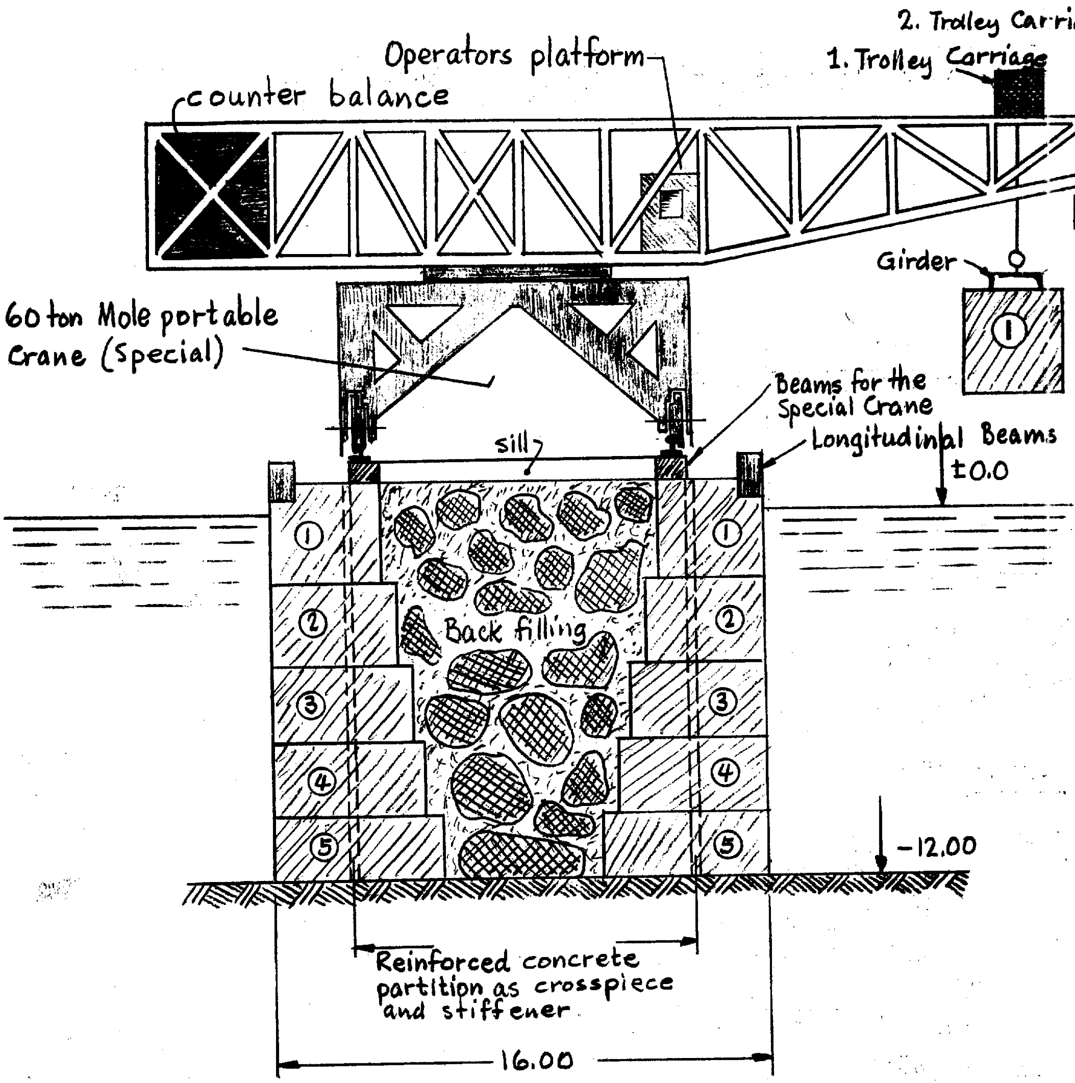

CROSS SECTION of the MOLE during CONSTRUCTION

Enclosure (F)

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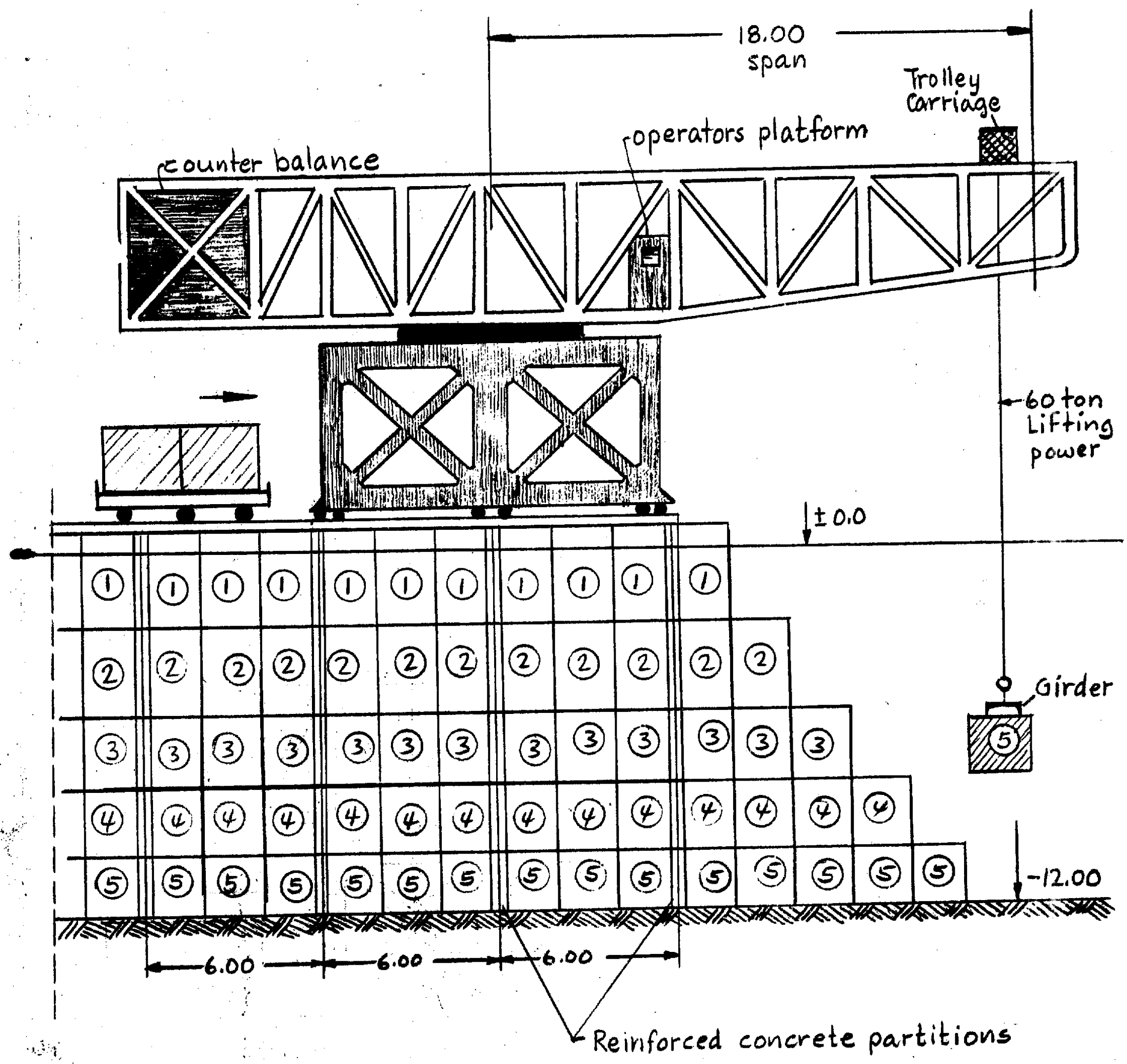

LONGITUDINAL SECTION of the MOLE during CONSTRUCTION

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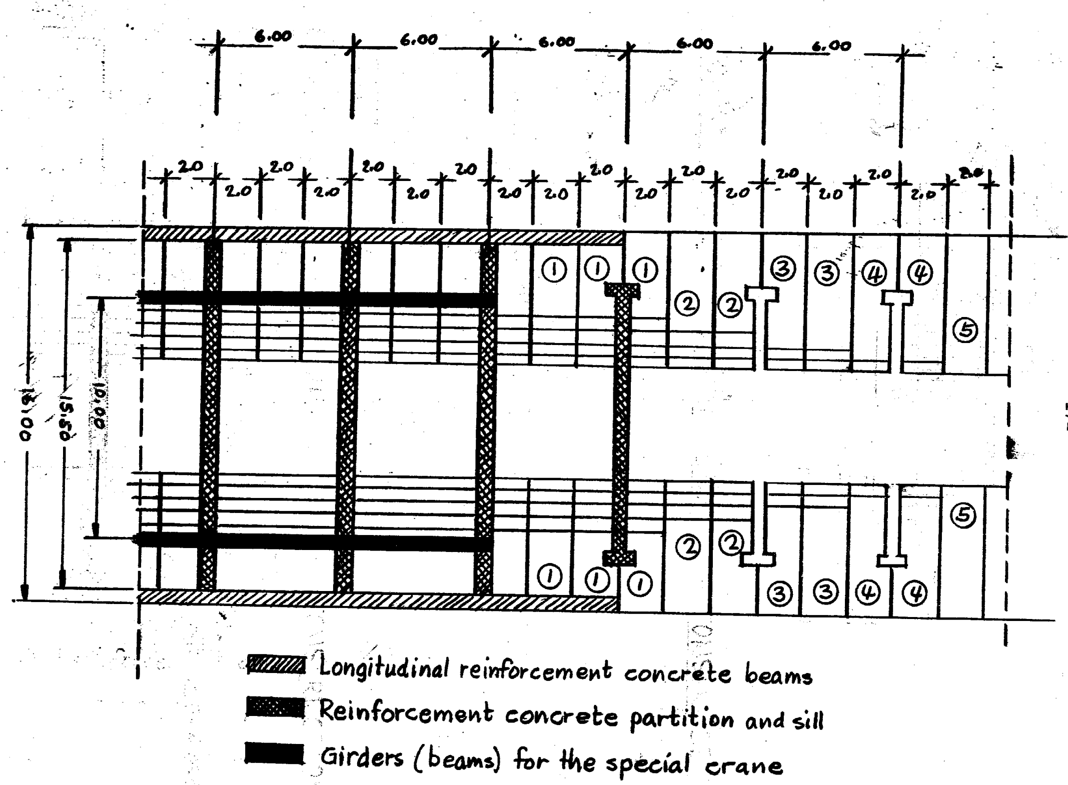
Enclosure (H)

TOP VIEW of MOLE in VARIOUS STAGES of CONSTRUCTION



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Enclosure (I)

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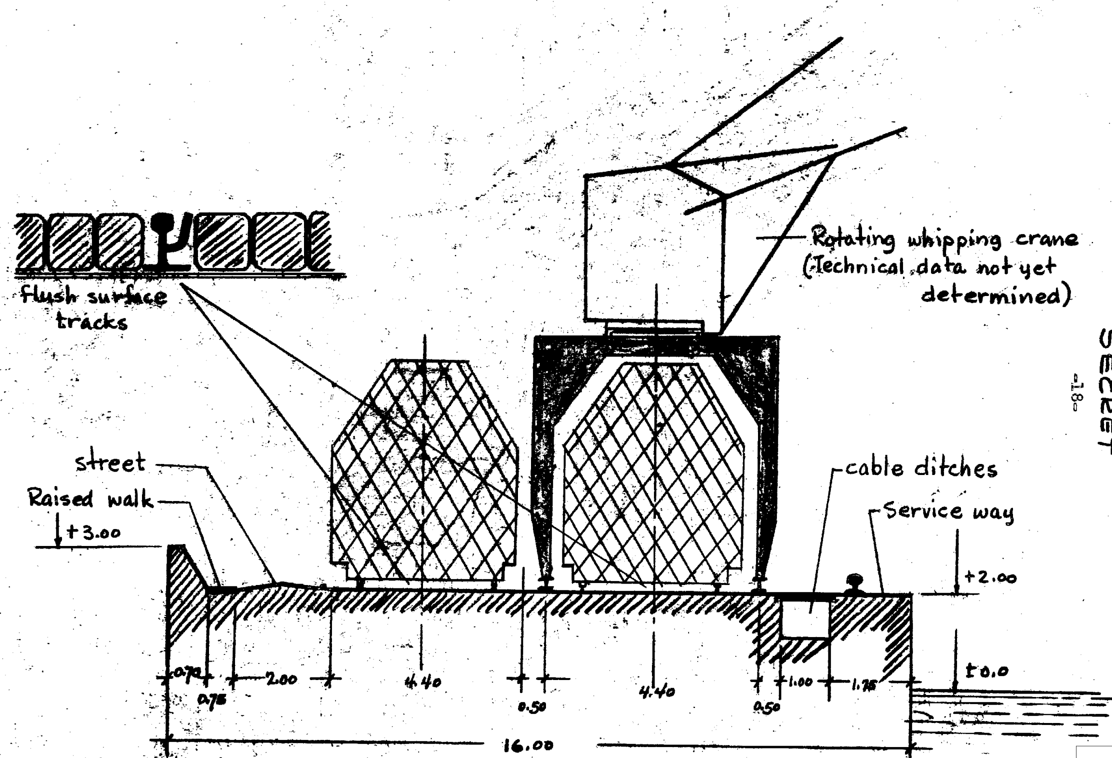
CROSS SECTION of COMPLETED MOLE showing TRANSPORT CAPABILITIES



Cross section of West Mole

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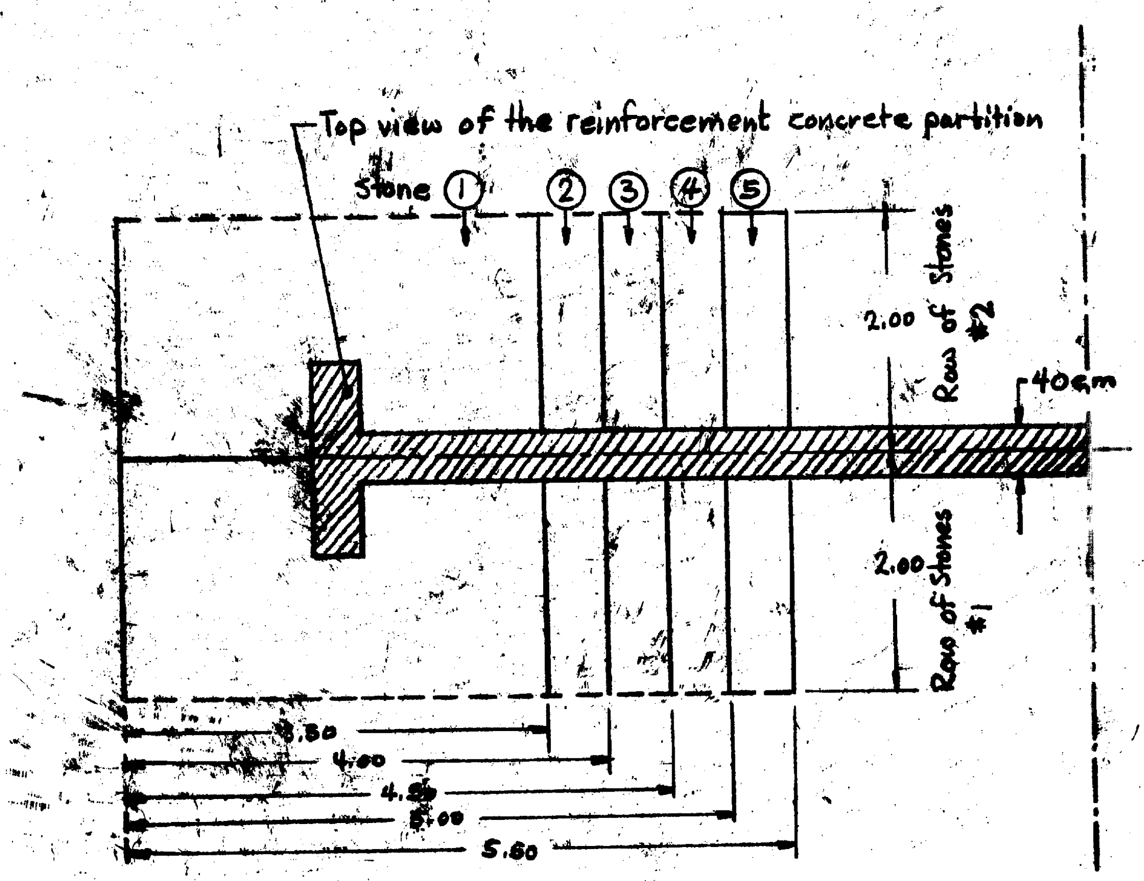

TOP VIEW SHOWING PLACEMENT of REINFORCED CONCRETE PARTITION

Enclosure (J)

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